

Claims

1. Apparatus for measuring hemodynamic parameters, especially for Augmentation Index (AIx) and/or Ejection Duration (ED), by non-invasive, cuff based occlusive, blood pressure measurement, which apparatus comprises occlusive, oscillometric automatic blood pressure meter and units, determining the values of hemodynamic parameters, characterised by
 - an oscillation wave separating and storing signal detector (1), the sampling rate thereof is at least 200/heart cycle; and has an storage unit (5) resolution thereof is organised at least 9 bit,
 - an preferably digital, anti-filter (8) to compensate the distortions rising at the sampling, separating and digitising the oscillation wave,
 - an amplitude arithmetic (6) unit establishing the Augmentation Index (AIx);
 - an synthetic organ (9) unit establishing the Ejection Duration (ED).
- 15 2. Apparatus according to claim 1 characterised by, that the sampling rate of the signal detector (1) is 180-220/second.
3. Apparatus according to claim 1 or 2, characterised by, that the storage unit (5) storing the signals, generated by the oscillation wave, is organised 10-12 bit.
4. Apparatus according to any of claims 1-3 characterised by, that it is equipped with a time-arithmetic (7) unit establishing the Pulse Wave Velocity (PWV), and/or integrator unit (3) establishing the Systole Area Index (SAI) and Diastole Area Index (DAI).
- 20 5. Apparatus according to any of claims 1-4 characterised by, that amplitude arithmetic (6), synthetic organ (9), preferably the time-arithmetic (7), and/or integrator unit (3) are joined to a common program controller (26), and compiled to an analyser (2).
6. Apparatus according to any of claims 1-5 characterised by, that it is combined with a portable, 24h ambulatory blood pressure monitor.
7. Apparatus according to any of claims 1-5 characterised by, that it is incorporated in a telemedical home care system.
- 25 30 8. Apparatus according to any of claims 1-5 characterised by, that it is combined with a

24h blood pressure monitor, which is controlled by a built-in ECG.

9. Method for non-invasive measurement of hemodynamic characteristics, especially
5 Augmentation Index (AIx) and/or Ejection Duration (ED), with an occlusive, pres-
sure-sensor cuff, placed on the brachial artery, and with the apparatus accordingly
any of the claims 1-8., by sampling, analysing, and evaluation of the signal flow
of the oscillations of the pulse waves, **characterised by** that a usual stepwise blood
pressure measurement is performed, and the SBP, DBP and HR values are stored,
thereafter the signal distortions rised at the sampling are compensated by an “anti-
filter” process, after it the cuff (11) is set over the systolic pressure, i.e. to supra-
10 systolic pressure range, preferably SBP + 35 mmHg pressure, and from the received
oscillation curves, on the basis of the wave amplitudes, we calculate the Augmenta-
tion Index (AIx); and on the oscillation curve determining the minimum-point after
the first reflex wave, we calculate the Ejection Duration (ED) value.

15 10. Method according to claim 9, characterised by, that the sampling rate is taken at
least 180 samples per second, preferably 200 samples per heart cycle, and the digit-
ised signals flow are stored at least in 9 bit resolution.

11. Method according to claims 9 or 10, characterised by that the cuff (11) is set to su-
20 pra-systolic pressure range, over the systolic pressure, preferably +35 mmHg pres-
sure, from the time shift of the main wave and the first reflex, respectively of the
measured sternal notch and pubic bone distance of the patient, are calculated the
Pulse Wave Velocity (PWV) value, and/or the cuff (11) is set to the already deter-
mined diastolic value or near to this, the received heart cycle curve are divided to
two part with the ED end-point, and thus are constituted the Systole Area Index
25 (SAI) and Diastole Area Index (DAI) values.